CHAPTER 10

NOISE

10-1 SCOPE

This Chapter contains criteria to control environmental noise within installations. It is limited to measures allowing reasonable internal DOD planning efforts, and does not address procedures for operating aircraft or ships, which are outside the scope of DOD Directive 6050.16.

10-2 DEFINITIONS

10-2.1 Day-night Average Sound Level (Ldn). A measure of installation noise exposure expressed in a single number ("xx Ldn" as in 55 Ldn) that is obtained by adding a 10 dB penalty to nighttime sound levels (from 2200 to 0700 hours) to account for increased annoyance caused by noise during these hours.

10-2.2 A-weighted Sound Level. Calculation of noise exposure that emphasizes sound in the frequency range where most speech information occurs, and thus closely resembles the frequency response of the human ear. Sound measures that are measured on the A-scale are abbreviated dB(A).

10-2.3 Decibel (dB). The unit of sound pressure is the decibel and is symbolically represented as dB. Sound pressure is the amplitude or measure of the difference between atmospheric pressure (with no sound present) and total pressure (with sound present). The decibel scale is a logarithmic scale.

10-2.4 Equivalent Level (Leq). The equivalent steady-state sound which, in a stated period of time, would contain the same acoustic energy as the time-varying sound during the same period.

10-2.5 Sound Exposure Level (SEL). The sound exposure level is a measure of single noise events, such as ground run up. It is the level, in decibels, of the time integral of squared A-weighted sound pressure over a given time period or event, with reference to the square of the standard reference sound pressure of 20 micropascals and a reference duration of 1 second.

10-3 CRITERIA

10-3.1 Installations with significant noise sources such as the operation of an airport will develop and maintain a noise contour map limited to the installations and areas immediately next to the installations.

10-3.2 Installations will use a computerized program for developing noise contours from operational data using Ldn noise descriptor system.

10-3.3 Noise analysis for airfields will be developed using the A-weighted day-night average sound level.

10-3.4 Installations will maintain records of incompatible buildings and land uses on the installation. Compatible uses are set out in Table 10-1.

10-3.5 Installations will review installation master plans to ensure that existing and future facility siting is consistent with an acceptable noise environment for the facility and areas next to it both on and off the installation.

10-3.6 The siting and conduct of ground run up will be evaluated for low frequency vibration as well as general audible noise.

10-3.7 Installations will identify noise sources that create noise impacts, investigate possible mitigation measures, and program resources to reduce noise impacts if practical.
10-3.8 Installations are required to maintain operational data to facilitate development of noise level contour installation compatible use zone studies.

10-3.9 Installations will have procedures to register and resolve noise complaints.

10-3.10 Installations will evaluate the noise impact of construction and other noise generating activities, and develop administrative procedures and/or physical measures to mitigate their effect, when needed. At the installations' discretion, the following computer programs are available for noise control planning:

a. The noise simulation program used to assess heavy weapons noise is MicroBNOISE. This software was developed and is maintained by the US Army Construction Engineering Research Laboratory.

b. Noise level contours for airfields are generated using the NOISE MAP computer program. This program is maintained by the US Air Force Armstrong Laboratory.

TABLE 10-1
ACCEPTABLE LAND USES AND MINIMUM BUILDING SOUND LEVEL REQUIREMENTS
Facility Outdoor Noise Environment (Ldn/Leq in dB)

	85-89	80-84	75-79	70-74	65-69
Family Housing	No	No	No	NLR30[4]	NLR25[4]
Bachelor Housing	No	No	NLR35[4]	NLR30[4]	NLR25[4]
Transient Lodging - Hotel, Motel, etc.	No	No	NLR35[4]	NLR30[4]	NLR25[4]
*Classrooms, Libraries, Churches	No	No	No	NLR30	NLR25
*Offices & Administration Buildings - Military	NLR40	NLR35	NLR30	NLR25	Yes
*Offices - Business and Professional	No	No	NLR30	NLR25	Yes
Hospitals, Medical Facilities, Nursing Homes (24-hr. occupancy)	No	No	No	NLR30	NLR25
*Dental Clinic, Medical Dispensaries	No	No	NLR30	NLR25	Yes
*Outdoor Music Shells	No	No	No	No	No
*Commercial & Retail Stores, Exchanges, Movie Theaters, Restaurants & Cafeterias, Banks, Credit Unions, EM/Officer Clubs	No	No	NLR30	NLR25	Yes
*Flight Line Operations, Maintenance & Training	NLR35[5]	NLR30[5]	Yes	Yes	Yes
*Industrial, Manufacturing & Laboratories	No	NLR35[5]	NLR30[5]	NLR25[5]	Yes
*Outdoor Sports Arenas, Outdoor Spectator Sports	No	No	No	Yes[1]	Yes[1]
*Playgrounds, Active Sport Recreational Areas	No	No	No	Yes	Yes
*Neighborhood Parks	No	No	No	Yes	Yes
*Gymnasiums, Indoor Pools	No	NLR30	NLR25	Yes	Yes
*Outdoor - Frequent Speech Communication	No[2,3]	No[2,3]	No[2]	No[2]	No[2]
*Outdoor - Infrequent Speech Communication	No[2,3]	No[2,3]	Yes	Yes	Yes
Livestock Farming, Animal Breeding	No	No	No	Yes	Yes
*Agricultural (except livestock)	Yes[3]	Yes[3]	Yes	Yes	Yes

* For detailed design, the Leq for the appropriate period of usage is the preferred measure of the noise environment.

Legend:

Yes - Land use compatible with noise environment. No special noise control restriction. Normal construction appropriate.

NLR - Appropriate noise level reduction where indoor activities predominate.

No - Land use not compatible with noise environment, even if special building noise insulation provided.

Notes:

1. Land use is acceptable provided special sound reinforcement systems are installed.
2. Land use may be acceptable provided special speech communication systems are used.
3. Land use may be acceptable provided hearing protection devices are worn by personnel. Check applicable hearing damage regulations.
4. Though it is recognized that local conditions may require residential uses in these areas, this use is strongly discouraged in Ldn 70-74 and Ldn 75-79, and discouraged in Ldn 65-69. The absence of viable alternative development options should be determined. NLR criteria will not eliminate outdoor environment noise problems and, as a result, site planning and design should include measures to minimize this impact particularly where the noise is from ground level sources.
5. The Ldn must only be incorporated into the design and construction of portions of these buildings where the public is received, office areas, and noise sensitive work areas or where the normal noise is low.

THIS PAGE INTENTIONALLY LEFT BLANK